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BUREAU OF ENTOMOLOGY

FOREST INSECT INVESTIGATIONS

INSECT DESTRUCTION  
OF  
FOREST TREES LEFT ON HIGHWAY STRIPS  
IN  
SOUTHERN OREGON

by

F. P. KEEN  
Entomologist  
U. S. Bureau of Entomology

Portland, Oregon  
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The possible destruction of trees by insects is only one angle of the problem of leaving uncut the virgin forest stands in strips along the public highways. And even the insect problem is a many-sided one, varying with the species of forest trees involved, the quality of the site, the time of year and manner in which the adjacent timber is cut, as well as many other factors.

In southern Oregon the most serious insect menace to forest trees which has any relation to the present problem is encountered in the various beetles which attack the pines. The firs suffer less than the pines from the attacks of killing bark beetles, and the cedars and junipers are affected scarcely at all. In fact, some of the heaviest insect damage in the state has occurred in the yellow pine forests of southern Oregon. Only in the case of lodgepole pine have greater losses occurred. From a review of what has happened here one can reasonably deduce what is apt to happen in the future in this region.

Beetle Damage to Pines in Southern Oregon

Through annual surveys the Bureau of Entomology has been keeping a continuous record of the beetle destruction in the yellow pine forests of Klamath and Lake Counties since 1920. During this period the average annual loss has amounted to 1.40% of the merchantable stand. This percentage of loss is much heavier on the poorer and drier sites, reaching in some cases on limited areas a maximum of 50% of the stand during a ten-year period; while on the better and moister sites the loss frequently averages less than .1% a year.

The beetles usually show considerable discrimination in the trees selected for their attack, under normal conditions preferring the slower-growing trees with poor crown development. The older and bigger trees are not necessarily selected unless they have poor crowns or have been injured by fire, lightning, breakage or other causes. However, under epidemic conditions this discrimination is less marked, and many of the younger and better trees are killed by the beetles, and the stands considerably thinned.

In addition to the above losses, which can be expected in any unthinned virgin yellow pine stand in southern Oregon, there are very apt to be additional losses as an indirect result of logging operations in the vicinity. Logging slash not only breeds up destructive engraver beetles which emerge and attack the nearby young growth, but it also has a tendency to attract the pine beetles to the vicinity of the operation and increase the destruction of trees left as a reserve. The increase in insect destructiveness following logging operations is rarely of long duration, and after two or three years epidemics thus induced tend to subside and a



more normal loss continues. The damage to young growth can be largely avoided if the slash is handled in a proper manner; but unfortunately the killing of the larger trees, due to the attractive influence of the cutting, is largely unavoidable and is to be expected as one of the consequences of timber cutting.

Thus the probabilities are that if a strip of virgin pine timber is left along the highways in southern Oregon and the adjacent timber cut, the resulting damage from insects will be about as follows:

1. Increased killing of reproduction and pole stands by the engraver beetles for a year or so unless the slash is currently disposed of;

2. A temporary increase in the killing of mature trees, due to the attractive influence of the slash and a concentration of beetles from surrounding areas into the stands adjoining the slash. Most of such damage can be avoided if the beetle population in the general vicinity is reduced to a minimum through control work or natural agencies;

3. After the temporary increase in destruction as a result of the disturbance created by the cutting operation, a resumption of beetle damage can be expected in the remaining stand which will be comparable to that previously existing in such stands. If the site is a poor one the losses are apt to be heavy; if good, with favorable moisture and growth conditions, the losses are apt to be very light.

Such losses, however, could be largely prevented by selectively logging out the beetle-susceptible trees, since the beetles exhibit such discriminating tendencies, thus reducing the trees subject to attack and improving the growth of the remainder. This would not mean that all the old veterans would have to go, but that the stand be weeded of the slow-growing, poorly-developed, thin-crown trees of various ages. Such thinning would reduce the competition and increase the vigor of the remaining stand. This would seem to be the only satisfactory way of preserving a thrifty forest cover on the strips adjacent to the highways with a relatively small amount of insect damage.

#### Conditions on the Bly Mountain Area

At the request of the Oregon State Highway Engineer, Mr. Roy Klein, an examination was made by Mr. J.A. Beal and Mr. W.J. Buckhorn, of this office, of a timbered border strip along the Klamath Falls-Lakeview Highway on Bly Mountain in Klamath County, in order to determine the insect situation on this and the adjoining area.

This particular area has been under observation by the Bureau of Entomology for the past ten years, and annual surveys have been made of the beetle damage to the western yellow pine stands. During this period the average per cent of stand killed has been at the rate of 1.21% annually, representing a loss of 122 board feet per acre per year, or about 100 trees per year per square mile of forested area. The loss has been heaviest on the exposed southern slopes and on the borders of the forest at the lower levels. Near the summit of the mountain and along the canyons the loss has been much less.



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The highway border strip examined by Beal and Buckhorn on March 25 and 26 was located on both sides of the highway in Sections 14, 15 and 22 of Township 37 S, Range 11 E, and consisted of a strip approximately 10 chains wide by 150 chains long. Another strip was run through the adjacent area on which all trees were classified as to age and crown development.

This highway strip is located on a good site in a draw between two ridges and over the summit of Bly Mountain where the stand is somewhat mixed with fir, indicating better moisture conditions than at the lower elevations, where the stand is mixed with juniper. In most places there is a heavy stand of yellow pine and fir. Reproduction on the area is good.

The strip tally of green trees indicates that of the trees now on the area approximately 15% are very susceptible to beetle attack and 27% are moderately susceptible. Thus a total of 42% of the trees (above 10 inches in diameter) fall in what are considered as susceptible tree classes.

On the highway strip the present infestation of the western pine beetle was found to be of average severity. On this area of 160 acres, with a stand estimated at 5,000 trees, 55 were found to contain bark beetle broods. Of these 45 contained broods of the western pine beetle and 10 harbored broods of the mountain pine beetle and of the engraver beetle. This means that 1.1 trees out of a hundred have been killed by beetles since last summer. A count was also made of the old trees killed by beetles which were still standing. About 200 of these were found. These represent the beetle losses on the strip during the last five or six years and are equal to about 4% of the stand.

Inasmuch as it may be desirable to preserve this strip for scenic purposes, the following suggestions are presented: From the standpoint of protection from insects it is important that the over-mature, slow-growing trees of poor crown development, which represent a highly susceptible group, be eliminated from the stand. In this case the removal of about 15% of the trees would eliminate the most objectionable, and the removal of 27% more would eliminate all those considered as susceptible to pine beetle killing.

Thus for the yellow pine type of southern Oregon, some method of selective logging which would remove from the stand those trees known to be poor beetle risks should give the greatest protection from serious damage from this source. While the preservation of the young and thrifty trees in the younger age classes, together with the older and larger trees considered as fairly beetle-resistant, should give a forest cover in every way adequate for highway scenic purposes, without the danger of continuous damage from insects.